

## Investigating students' pedagogical use of ICT in learning in Ghanaian secondary schools

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### Abstract

*The purpose of this study was to explore students' pedagogical use and perceptions of ICT in secondary schools in Ghana. A focus group interview was used to gather data from participants. Ten groups of six students each from urban, semi-urban and rural schools were chosen for the focus group interviews. The study found that students' pedagogical use of ICT was low. Also, students were appreciative of ICT value. However, they were concerned about the morally inappropriate use of the technology. Finally, the findings indicated that students perceived costs as barriers to their use of ICT. These barriers should be reduced to help students' ICT use and integration. The results of the study would contribute to better understanding of the students' pedagogical integration of ICT in low technology environment.*

**Keywords:** Pedagogical, perceptions, perceived value, expectancy of success, perceived cost

### Introduction

In the twenty-first century, education cannot be separated from technology. Rapid growth in information and communication technology (ICT) has made the world knowledge-driven. As ICT continues to reshape economies, it is necessary for citizens to be highly competent in the use of the technology. To provide learners with "twenty-first century skills- those competencies and values needed to become responsible citizens in a learning society and sustain employability throughout life in a knowledge economy" (UNESCO, 2013: 8), many governments have put in place master plans, programs and strategies to improve on their national curricula (Law, 2009: 25; Balanskat & Gertsch, 2010: 36).

In addition, many developed and middle-income states have significantly invested in educational technology in recent years. However, investment in educational technology in least developed countries is still low (UNESCO, 2013: 9). For example in United Kingdom, government spending on primary and secondary schools in 2012/13 academic year was £285million and £247million respectively (BESA, 2012: 3), in United States, the expenditure on K-12 schools and post-secondary was \$2.9 billion and \$24.4billion respectively in 2010 (Council of Economic Advisers, 2011: 1) and in South Korea, the cost of computers, internet and communication in 2013 was \$ 61 million (futureGov, 2013: 1). Ghana is no exception to this global investment in ICT resources in schools. The government has provided secondary schools with computer laboratories, Internet and science resource centres to support teaching and learning (Ministry of Education, 2009: 11). However, while there is a great deal of knowledge about the provision of ICT infrastructure and equipment in secondary schools, the pedagogical use of ICT is limited in Ghanaian schools. Thus the potential of ICT to support the way students learn has not been realized (Ministry of Education, 2009:11). Therefore, this study seeks to investigate students' use and perceptions of ICT in their learning.

### **Problem Statement**

In Ghana, ICT has recently been introduced into the curriculum. Because of its newness in schools, ICT may not be well accepted by students. Considering this concern, students' pedagogical use and perceptions of ICT were investigated. Here, pedagogical use refers to students' use of ICT to support their learning.

### **Literature review**

#### **Theoretical framework: Expectancy-Value Theory**

Eccles et al. (1983: 81), Wigfield (1994: 51), and Wigfield and Eccles (2000: 69) proposed an expectancy-value model of motivation. The theory is used to understand and predict people's perceptions of technology. Expectancy-value theory suggests that individual's decision to perform a certain task depends on the belief that there are benefits in carrying out the task and belief that they can succeed. Specifically, the expectancy of success and perceived value must be high.

According to Eccles et al. (1983), "one's perception of the value of an activity is more important in determining one's decision to engage in that activity, while one's self-concept of ability is more important in determining one's actual performance" (p. 113). They defined four different components of achievement values: attainment value, intrinsic value, utility value or usefulness of the task and cost. Attainment value is the importance of doing well on the task. Intrinsic value is the enjoyment the individual gets

from performing the activity. Utility value is how well a task fits into current and future goals, such as career goals. Cost refers to how doing one activity interferes with doing other possible activities; performing a school assignment implies one cannot call a friend.

Wozney et al. (2006: 177) adopted expectancy-value theory to study teachers' views and practices of computer technology in secondary schools. They concluded that value, expectancy of success determined teachers' use of ICT in schools. Based on the work of Wozney et al. (2006), expectancy-value theory is adopted in the current study to explore students' views of the pedagogical use of ICT in classroom. According to this theory, individual's perceived value and expectancy of success determine their intentions to perform a task. In other words, students would use ICT in learning if the perceived value and expectancy of success of the innovation are high and if these values outweigh the perceived costs of pedagogical use of ICT. In the present study, value item examines students' perceptions of the usefulness or benefits of technology. Expectancy of success explores students' perceptions of successful pedagogical use of ICT (Wozney et al., 2006: 195). Cost item investigates students' perceptions of the physical demands of implementation functioning as a disincentive or barrier to pedagogical use of ICT (Wozney et al., 2006: 178).

The successful implementation of educational technology in a school's program depends strongly on the teachers' and students' attitudes (Selwyn, 1999: 129; Teo, 2006: 21). Teo (2008: 419) inferred that students' attitudes and their readiness to accept computer technology are critical to the success of their learning. Students' positive attitudes toward technology are necessary if computers are efficiently incorporated into teaching and learning process in schools. As students' experiences with computers increase, their attitudes towards ICT become more positive (Kubiato, 2010: 24); however, using ICT in traditional ways of teaching negatively affected students' attitudes (European Commission, 2003: 32).

## **Research Questions**

In this study, the two research questions addressed were

- (1) How do students pedagogically use ICT in their learning?
- (2) What are students' perceptions of pedagogical use of ICT in learning?

## **Methodology**

### **Participants**

The current study used focus group interviews to collect data from participants. Kitzinger (1995: 299) stated that the main advantage of focus group interviews is the

purposeful use of interaction to get data. However, one disadvantage of focus interviews is that they can silence individual voices of dissent (Kitzinger, 1995: 300). Sample size for focus group interview has become a controversial issue, as there is little agreement as to what is most appropriate. Fern (1982: 1) studied the influence of size on focus group discussion and found that a group of eight gave more ideas than a group of four. However, Kitzinger (1995: 301) recommended four to eight participants in a focus group interview. In this current study, a purposeful sampling procedure was used to select both students for the focus group interviews from 24 public and private secondary schools. Six (6) students comprising both males and females were selected for the students' focus group interviews.

## **Data Collection**

Ten focus group interviews were conducted with four groups of urban students, three groups of semi-urban students and three groups of rural students. Stewart and Shamdasani (1990) suggest that there are no general rules as to the optimal number of focus groups. They argued that the number of groups should base on the similarity of the potential population, and the ease of research application. However, they suggest that one focus group may well be enough. Kitzinger (1995: 301) suggests that focus group studies should consist of four to eight people. In this study, ten groups of six students each from urban, semi-urban and rural schools were chosen for the focus group interviews.

In the present study, the researcher acted as a moderator of the interviews. The role of the moderator was explained to the participants: that he would ask the questions and seek clarifications but remain neutral during the period of the interview. Participants were given the chance to express their thought freely without fear. They were told to speak individually and a time limit of one hour was allotted to the discussion. They were given the opportunity to ask questions before and after the interviews. Ground rules were set for all the groups before the commencement of the interview. Use of a tape recorder was explained to the participants. Assurances of confidentiality were given. They were guaranteed that there would be privacy in collecting, keeping and handling data. Also, they were assured that the data would be destroyed at the end of the research. Anonymity was ensured because participants did not provide their names during interviews. The interviews were tape recorded. The tape-recording served the following purposes: it acted as validity checks in that raw data were collected for analysis, the recorded data would serve a range of logical interests and finally events could be reviewed as frequently as possible and necessary (McLafferty, 2004: 191).

## **Data analysis**

Tape-recorded interviews were transcribed into text and then analyzed. The processes followed during the content analysis included assigning codes to represent, classify, and

organize data into identifying themes. In assigning codes, the transcripts were read repeatedly and grouped according to the participants' responses to the research questions. After grouping of data, repeated words and expressions in each group were identified and then labeled into coding categories. Finally, relationships among codes were identified and then grouped into themes before reporting.

Member checking was another technique used to ensure credibility of the study. The participants of each focus group were convened to review the findings. Throughout the process, the participants were asked to ascertain that the themes made sense, whether they were developed with sufficient evidence and whether the interviews recorded were accurate and reflected the meanings of their views. In turn, the participants' comments were incorporated into the final narrative. In doing so the participants added credibility to the qualitative study by having an opportunity to react to the final technique.

## Findings

### Research question 1: How do students' pedagogically use ICT in their learning?

The qualitative data (focus group interview) provided an understanding of the kind of activities students use ICT for. The students stated that they "use the internet in their learning". They said in using the internet they explore new materials and even conduct research on their own initiatives. One student stated that "I use the internet to search for information to do my assignment and also to download sample examination questions for practice". A student who expressed similar opinion said that he or she uses smart phone to download learning materials and communicate with colleagues to exchange ideas and received more assistance from his or her friends. Additionally, another student said that "we have friends in other schools; so we send email to find out what they have studied". Others mentioned that "they use calculators to perform simple and complex computations".

To probe further to know other activities students use ICT for, a follow up question was asked: What other activities do you use ICT for? Most of the students said that "they use ICT to play games, chat with friends on Facebook, communicate with peers, watch movies, download software such as Google chrome and movies, and listen to music". Though the use of ICT in teaching and learning has not been fully applied, at least some few technological innovations have been initiated by some students in their learning. In other words, some students are using ICT as a tool to improve and support their learning process.

## **Research question 2: What are students' perceptions of pedagogical use of ICT in learning?**

The findings of this question were based on students' attitudes toward perceived value, expectancy of success and perceived cost of pedagogical use of ICT. Perceived value refers to students' perceptions of the usefulness of ICT in learning. Students who were interviewed believed integrating ICT into learning would:

(i) improve typing skills, (ii) make communication easier, (iii) make learning easier and faster, (iv) help to collaborate with different people around the world and (v) help easier and faster access to information.

In addition, most of the students stated that ICT would (i) improve knowledge and skills, (ii) motivate them to learn (iii) improve academic performance (iv) serve as visual aid for learning, (v) broaden knowledge, (vi) make understanding of abstract concept easier and (vii) save time and energy. However, most students expressed fear of the immoral behaviour ICT, particularly the internet, is introducing into the society. A student stated that "we are exposed to all kinds of social vices such as cyber fraud, pornographic scenes, hacking, etc".

One student said "ICT has helped me to acquire the skills to learn on my own and has increased my motivation for learning towards my course".

Expectancy of success refers to students' perceptions of successful pedagogical use of ICT. Students who were interviewed also said that the use of ICT in learning can be successful if the following are available: (i) access to the internet, (ii) availability and adequate computer laboratories, (iii) access to computers at home (iv) parents' support and motivation, teachers' and friends' support and (v) more ICT periods on the timetable.

In addition, a majority of the students indicated that (i) adequate computers in schools, (ii) more knowledgeable ICT teachers, (iii) government support in terms of provision of computers, and software, (iv) having confidence to use computers, (v) technical support and (vii) regular access to the computer laboratories.

Cost item refers to students' perceptions of physical demands of implementation functioning as a disincentive to pedagogical use of ICT. Students who were interviewed identified costs to be: (i) less ICT periods on the timetable, (ii) less time to learn ICT because of overloaded syllabus (iii) insufficiency of software.

Also, students identified other barriers as inadequate computers in schools, instability of electricity, lack of knowledge in ICT, infrequent access to the computer laboratories, lack of parents', teachers' and peers' support, lack of qualified ICT teachers, inadequate computer laboratories, schools' strict policies on access to computer laboratories, and

malfunction of ICT equipment (e.g. computers, uninterruptible power supply, etc). Finally, lack of internet and slow internet connection, strict schools' rules and regulations on the use of smart phones in schools, slow speed of computers, and lack of computers at home were further obstacles to pedagogical use of ICT identified by students. From this study, it is clear that students perceive costs as key barriers to the pedagogical use of ICT. Therefore, it is essential to reduce the costs of contributing to students' low pedagogical use of ICT by providing ICT-rich environments for students in order to make full use of ICT in classrooms.

## **Discussion**

In this study, it was revealed that students used ICT to explore new materials for their learning and also conduct research on their own initiatives. This implies that ICT is used by students in a way to support their learning. Barak (2006: 133) suggests that students who believe in constructivist learning approach might find technology more important in enhancing learning. Though the use of ICT in learning has not been fully applied, at least some few technological innovations have been initiated by some students in their learning. In other words, some students are using ICT as a tool to improve and support their learning process.

The findings from the study have confirmed the educational value of ICT claimed by several studies. For example, Fančovičová and Prokop (2008: 256) asserted that when ICT is used properly, it can support students' collaboration and knowledge building. The current study revealed that students were appreciative of the value of ICT in their learning. Thus, the study supports the conclusion that students are conscious of the usefulness of ICT and would be expecting to use it when suitable environments are provided. Though, students were appreciative of the benefits of ICT in education, they were concerned about the negative effects of the technology on their education. This finding confirms Albirini's (2006: 385) apprehension about the moral and culturally inappropriate aspects of ICT.

The findings from this study found that students' successful pedagogical use of ICT would depend on availability of technological resources, educators' ICT competencies and parents' motivations. These expectancies of success are strongly linked to students' ability to perform the tasks (Wigfield, Tonks & Eccles, 2004: 176). In other words, students' perceptions of expectancy of success are linked to their decision to the pedagogical use of ICT in classrooms.

Finally, students perceived the costs associated with pedagogical use of ICT as the major barriers to their use. Students believed that if technological resources, parents' motivations and administrative support were adequate then the school environment would support the integration of ICT into education.

## Conclusion

The study found that students' pedagogical use of ICT was low. However, at least some few technological innovations have been initiated by students in their learning. As future leaders of any country, the government and all stakeholders should provide students with the necessary knowledge and skills to enable them to apply ICT in their specialized fields. Students were appreciative of the value of ICT in education. Therefore, ICT resources, schools' support and parents' motivations should be given to students to increase their ICT integration into learning.

The limitation of the current study was that the use of self-developed questionnaire could have affected the reliability of the analysis. In addition, the use of interview method only to collect data could have limited the results. Future research could adopt an observation method to add to the data. Finally, the sample size was small. Future research involving more schools to increase the sample size can be investigated to give comprehensive perspectives of ICT implementation in schools.

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